Please make a copy of this document and include this in your GitHub repository for your submission, using the tag #AndroidDevChallenge

Tell us what your idea is.

Describe in 250 words what the feature or service will do and how you'll use Machine Learning to push the bar:

Some people have trouble reading facial expressions due to Autism or Asperger's. This difficulty in reading facial expressions can lead to relational issues, which can then affect many different aspects of their lives. Forming new relationships may be harder, and they may be misunderstood by their peers or their colleagues. At home, their family members may find it difficult to connect with them.

My idea is to utilize on-device machine learning to quickly read the emotions of another person. There will be a live camera view, where the camera is pointed at another person's face. The emotions of that person is displayed via text on the screen in real time. Augmented reality can be used to display the emotions in other ways. For instance, for kids, an animated cartoon character can be displayed on the person's shoulder. Or, there can be environmental effects such as rain or snow, that may mirror the person's emotions.

An extension of this idea is to help people train their brains to read emotions on their own and to mirror their own facial experiences to match that of the other person. For this, both the front-facing and back-facing cameras can be used. On the screen, the user is prompted to match the emotions of the other person. A single-player, gamified version of this app will allow the user to train on their own.

I believe that such an app would be useful and will enrich the lives of those with this disability.

Tell us how you plan on bringing it to life.

Describe where your project is, how you could use Google's help in the endeavor, and how you plan on using On-Device ML technology to bring the concept to life. The best submissions have a great idea combined with a concrete path of where you plan on going, which should include:

- *(1) any potential sample code you've already written,*
- *(2) a list of the ways you could use Google's help,*

- *(3) as well as the timeline on how you plan on bringing it to life by May 1, 2020.*

(1) The sample code will be in this repo!
(2) Some of the ways that Google can help is to help me find the data to train the model. I'm planning to use free 3d models, but if Google would like to provide 3d models and animations, I think that would look fantastic!
(3) A rough timeline might look something like this:

December - Scope project & create barebone app. Take some online courses on machine learning!

January & February - Train model & hook it up to app

March - Add 3d models & environmental effects

April - the 2 player mode (show both the front and back cameras)

Stretch goal - and then the gamified single player mode.

Tell us about you.

A great idea is just one part of the equation; we also want to learn a bit more about you. Share with us some of your other projects so we can get an idea of how we can assist you with your project.

I'm an android engineer by day. I work at Wayfair, and work on their augmented reality / 3d stuff. I also work on my personal apps by night. My personal website is at https://cliveleehere.github.io/ , which lists some of my apps.

I had tried to make something like this at a hackathon, using Unity and Hololense. Because the machine learning model was on the cloud, there was a noticeable latency, which definitely limited its usability. Having it on an Android device would make it a lot more accessible to a lot more people!

Next steps.

- Be sure to include this cover letter in your GitHub repository
- Your GitHub repository should be tagged #AndroidDevChallenge

- Don’t forget to include other items in your GitHub repository to help us evaluate your submission; you can include prior projects you've worked on, sample code you've already built for this project, or anything else you think could be helpful in evaluating your concept and your ability to build it
- **The final step is to fill out this form to officially submit your proposal.**